COMMUNITY ENVIRONMENTAL ASSESSMENT PROCESS

for

75TH STREET WASTEWATER TREATMENT PLANT DEWATERING IMPROVEMENTS

for

CITY OF BOULDER
PUBLIC WORKS-UTILITIES DIVISION
1739 BROADWAY
BOULDER, CO 80302

Rothberg, Tamburini & Winsor, Inc.
Professional Engineers and Consultants
1576 Sherman Street, Suite 100
Denver, Colorado 80203-1713

RTW Project No. OE-8072-SC

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Description and Location of Project

The City of Boulder and Rothberg Tamburini and Winsor, Inc. (RTW) are working together to design upgrades to the Dewatering Facilities at the City of Boulder's 75th Street Wastewater Treatment Plant (WWTP). The new facilities will treat solids produced from the liquid treatment processes at projected 2025 flows (buildout). The solids treatment system will be needed to meet current and anticipated solids production from the treatment of liquid wastewater and regulatory limits for biosolids reuse or disposal. All domestic and industrial wastewater generated within the City of Boulder is processed at the 75th Street WWTP. Septic wastes, hauled to the facility by private haulers, are also processed at the facility. Biosolids are produced from the treatment of these wastewaters.

The City of Boulder's 75th Street WWTP is located at 4049 75th Street in the SW ¼ of Section 13, T1N, R70W, Boulder County, Colorado (Figure 1). Treated effluent is discharged to Segment 9 of Boulder Creek. The WWTP is defined as a major facility by the Colorado Department of Public Health and Environment (CDPHE), and operates under a Colorado Discharge Permit System (CDPS) permit (Number CO-0024147) dated February 2003. The liquid treatment facilities are being expanded to provide capacity for higher flows and to produce a higher quality effluent, as required by the permit. In March 2004, a Community and Environmental Assessment Process (CEAP) report was completed for the WWTP liquid stream improvements project. Biosolids produced from the existing facility are treated and reused either in agricultural land application or via composting at a private facility.

Proposed upgrades to the liquid stream, planned to be on-line in 2007, will increase plant capacity from 20.5 MGD to 25 MGD. Not only will plant capacity increase, more potential pollutants will be removed from the liquid stream. In order to accommodate the increased solids production from these improvements and to upgrade the existing processing equipment, new dewatering facilities and appurtenances will be needed. The WWTP liquid expansion and the solids handling improvements will be contained within the existing designated WWTP site boundary.

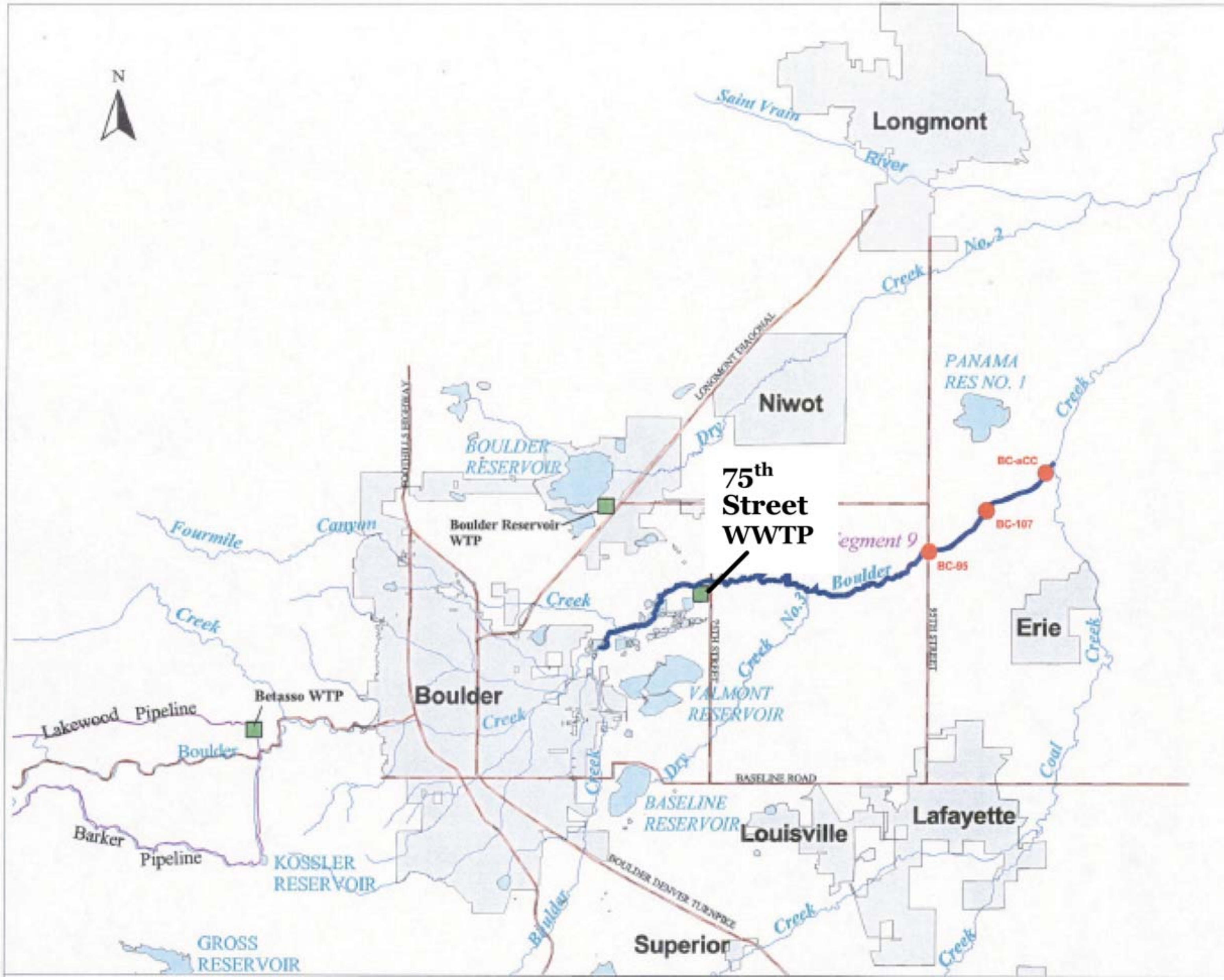

Figure 1 - Boulder Creek Segment 9 and 75th Street WWTP

Rothberg
Tamburini
Winsor

8072-sc Boulder/fig.cdr

Background; Purpose and Need for the Project

The 75th Street WWTP was placed in service in 1968 and was originally designed to treat 5.2 MGD. The most recent completed WWTP upgrade was in 1988, which increased the capacity to 20.5 MGD (maximum 30-day flow). A construction project was initiated in 2005, with planned completion in 2007, which will increase the capacity to 25 MGD. In addition to higher volumes of flow, the upgraded facilities will remove more contaminants from the wastewater and treat to lower concentration levels. When the new liquid stream treatment system is on line, the estimated annual average production of solids will be approximately 7.4 dry tons of primary solids daily and 7.2 dry tons per day (dtpd) of secondary solids, for a total of 14.6 dtpd. The total solids produced during the maximum month conditions in 2007 are estimated to be 17.5 dtpd. At buildout, the estimated annual average and maximum month solids production will be 17.3 dtpd and 23.3 dtpd, respectively. The digestion process will reduce this volume to approximately 9.6 dtpd and 11.6 dtpd, average and maximum month. This quantity of biosolids will have to be removed from the plant to assure efficient operations.

When the liquid stream improvements are completed, the treatment processes at the WWTP will include:

- Influent flow measurement
- Screening
- Grit removal
- Primary sedimentation
- Secondary treatment employing activated sludge configured to remove nitrogen
- Secondary clarifiers
- Chlorination (using gaseous chlorine) and dechlorination (using gaseous sulfur dioxide); both processes will eventually be replaced with ultraviolet light (UV) disinfection.

Effluent from the 75th Street plant is discharged to Boulder Creek. This discharge has been regulated under the terms of a discharge permit issued by the CDPHE since the early 1970s

Biosolids from the 75th Street plant are produced by treating the waste materials generated by the treatment of liquid wastewater. Once treated, they are dewatered to reduce their volume and stored on-site as a semi-solid material. The biosolids are then trucked to eastern Colorado for agricultural (land) application. If agricultural sites are not available due to poor weather or farming operations, the biosolids are hauled to A-1 Organics, a private composting operation where the biosolids are used to produce Class A compost that is then marketed as a soil amendment. The solids treatment stream includes:

- gravity sludge thickeners
- dissolved air flotation sludge thickeners
- anaerobic digestion
- centrifuge dewatering
- biosolids storage tanks
- dewatered biosolids storage
- truck hauling of dewatered biosolids
- land application of biosolids.

The dewatering facilities are one of the critical steps in the solids process because they reduce the volume of product, which allows the material to be trucked off site efficiently and cost effectively. The removal of solids produced in the treatment process is critical to stable operations and in maintaining permit compliance.

The dewatering facilities were constructed in 1987 and, at that time included two centrifuges and various appurtenances, such as polymer systems and storage tanks. These two original centrifuges are near or at their design life and need to be replaced. Due to the high level of maintenance required and the difficulty in obtaining spare parts, a third centrifuge was installed in 2005. However, due to space limitations in the existing dewatering building, this new centrifuge is not large enough to handle the loads that will occur at build-out when the new liquid treatment systems are on line.

The existing equipment has a total capacity of approximately 320 gallons per minute (gpm), assuming all three devices are in operation. In the future, two, larger centrifuges, each with a capacity of approximately 250 gpm will be needed. In summary, based on the age, condition, and capacity of the existing dewatering equipment, it is necessary to upgrade the dewatering system. Currently these facilities handle, on average, approximately 6.3 dtpd.

The biosolids project goals include the following:

- Provide solids processing and adequate treatment capacity to treat anticipated service area buildout wastewater flows of 25 MGD based on maximum 30-day flow conditions.
- Consistently meet regulatory limits for reuse of biosolids, including:
    - Volatile solids reduction
    - Pathogen reduction
    - Vector attraction reduction
    - Metals

Provide a solids treatment system capable of reducing the volume of material produced to lower total operational costs and reduce the amount of truck traffic that must enter and exit the plant for hauling of biosolids.

- Replace aging dewatering equipment.

Description of Process Alternatives and Summary of Major Issues

Several potential process alternatives were evaluated for expansion and upgrade of the WWTP biosolids processing facilities. Based on previous planning and engineering efforts (1997 Class "A" Biosolids Management Study, and the preliminary engineering for the Biosolids Recycling Center at Valmont Butte), several alternatives that maximize the use of the existing WWTP site were identified. Using project team discussions and the initial process alternatives review, the following three alternatives were developed and evaluated:

1. Do nothing,
2. Maintain semi-solid (10-12% solids) dewatering (existing process)
3. Transition to a cake (20-24% solids) product (new process)

Alternatives 2 and 3 are based on centrifuge dewatering of the digested biosolids produced from the liquid treatment. Whether the final product was a semi-solid or cake, the biosolids could be agriculturally (land) applied or the solids could be delivered to A-1 Organics for privatized composting.

In developing these alternatives, the costs and benefits of using existing structures or constructing new facilities were examined. Two processes were considered: semi-solid (10-12% solids) and cake (20-24% solids) production. Each alternative would provide the level of biosolids processing and treatment required for existing (20.5 MGD) design flows and the projected (25 MDG) design flows solids production. Construction required to implement the chosen alternative would coincide with the liquid stream improvements construction such that the plant's biosolids treatment capabilities grow in parallel with its liquid treatment capability.

The following summaries of these three alternatives present the advantages and disadvantages of each.

Alternative 1: Do Nothing

The "Do Nothing" or "no action" alternative relies on the existing dewatering equipment and facilities. Digested biosolids would continue to be dewatered to a semi-solid state utilizing the three existing centrifuges (two old and one new), then stored and hauled to agricultural land application.

This alternative is not acceptable as the existing equipment would not the capacity to meet the future WWTP solids loading when plant flows reach 25 MGD.

Additionally, the existing equipment is almost 20 years old, and finding replacement parts for the units has proven very difficult, greatly reducing their reliability and the plant redundancy. The existing equipment in operation at the WWTP is insufficient to handle the upgraded plant's biosolids production of 11.6 dry tons/day in approximately 20 years. This alternative, which would eventually lead to regulatory noncompliance at the WWTP, is not an acceptable option.

Pros of this alternative:

- Requires no capital expenditures
- No construction impacts

Cons of this alternative:

- Existing equipment is old and replacement parts are difficult to find
- The short-term inability to meet dewatering and biosolids processing requirements
- Long-term inability to meet dewatering and biosolids processing requirements
- Inability to store non-dewatered biosolids on site
- Violations of permits and regulations

Estimated capital cost for this alternative: $0.
Operations and maintenance cost estimate for this alternative: Not applicable because adequate solids treatment will be impossible at build-out.

Alternative 2: Semi-solid Product

Alternative 2A: Utilize Existing Centrifuge Building

Alternative 2A would be similar in operation to the existing operation by maintaining semi-solid biosolids dewatering. New centrifuges would replace the existing units. Alternative, 2A, would involve installing new centrifuges in the existing dewatering building.

Pros of this alternative:

- Regulatory compliance
- Makes maximum use of existing structures to house the centrifuges
- Similar operation is familiar to existing plant staff

- The semi-solid product is similar to the existing operation and would use liquid storage after the centrifuges, as is currently practiced

Cons of this alternative:

- The new centrifuges must be smaller and operate longer each day due to space limitations
- Structural concerns if existing buildings are modified again
- Limited ability to modify the existing building
- Opinion of probable cost (OPC) is highest for this alternative compared to other alternatives due to retrofitting difficulties, longer run times, more common equipment failure, and greater staffing needs.

Estimated capital cost for this alternative: $9,227,850.
Operations and maintenance cost estimate for this alternative: $2,455,500.
Total present worth of this alternative: $41,168,850

Alternative 2B: Construct New Centrifuge Building

Alternative 2B would involve installing new centrifuges in a new solids dewatering building, constructed adjacent to the existing building.

Pros of this alternative:

- Regulatory compliance
- Upgraded, larger equipment in new building
- The semi-solid product is similar to the existing operation and would use liquid storage after the centrifuges, as is currently practiced

Cons of this alternative:

- Requires construction of a new facility
- OPC is higher for this alternative than for other alternative(s) due to the increased water content of the biosolids and the need for a more expensive, long-term trucking contract.

Estimated capital cost for this alternative: $11,839,350.
Operations and maintenance cost estimate for this alternative: $2,075,500.
Total present worth of this alternative: $38,837,350.

Alternative 3: Cake Product

Alternative 3 would involve producing a cake product that has characteristics more like a solid material. New centrifuges capable of producing 20-24% solids would be utilized.

Alternative 3A: Utilize Existing Centrifuge Building

Alternative 3A would involve installing new high-solids centrifuges in the existing building

Pros of this alternative:

- Regulatory compliance
- Makes maximum use of existing structures to house equipment
- Would produce a drier material, resulting in a lower biosolids volume hauled from the facility
- Fewer trucks required would result in lower O&M costs

Cons of this alternative:

- Cake storage would be needed
- The centrifuges must be smaller and operate longer each day due to space limitations.
- Structural concerns if existing buildings are modified again
- Opinion of probable cost (OPC) is highest for this option due to retrofitting difficulties, longer run times, more common equipment failure, and greater staffing needs.

Estimated capital cost for this alternative: $10,600,750.
Operations and maintenance cost estimate for this alternative: $1,998,800.
Total present worth of this alternative: $36,601,050.

Alternative 3B: Construct New Centrifuge Building

Alternative 3B would involve installing new high-solids centrifuges in a new solids dewatering building, constructed adjacent to the existing building.

Pros of this alternative:

- Regulatory compliance

- Would produce a drier material, resulting in a lower biosolids volume hauled from the facility.
- Fewer trucks required would result in lower O&M costs
- Provides maximum flexibility for the final disposal of biosolids
- OPC for this alternative is the lowest due to properly sized structure and equipment, reduced staffing requirements, and reduced hauling costs.

Cons of this alternative:

- Cake storage would be needed
- Requires construction of a new facility

Estimated capital cost for this alternative: $11,473,000
Operations and maintenance cost estimate for this alternative: $1,775,000
Total present worth of this alternative: $34,562,000

Following the initial alternative evaluation, Alternative 3B (cake product utilizing a new solids dewatering building) was selected for a thorough analysis. This alternative was selected for three reasons.

a. Cake product is becoming the norm in the industry and producing drier material results in fewer truck trips from the WWTP site.

b. A new dewatering building is appropriate for the new equipment due to size constraints and age of the existing building.

c. Based on RTW's OPCs for the alternatives available, it follows that retrofitting the existing facilities would result in higher lifetime costs for the WWTP. These reasons are included in the above bulleted highlights for each alternative. To reiterate, cost advantages for constructing a new building versus using the existing building include:

- Installation of properly sized equipment with lower operating costs,
- Lower staffing needs,
- Redundant capacity,
- Greater flexibility, and
- Lower maintenance costs.

Following the selection of this alternative, more detailed analyses of the facilities were performed. The building configuration and the method of storing biosolids cake were evaluated. Two- and three-story buildings were evaluated, as was storage in either a vertically oriented silo or horizontally oriented hopper.

Table 1 Alternative 3B Building Layout Cost Comparisons

Cost Component/Alternative	3-Story Building with Cake Hopper	2-Story Building with Cake Hopper	2-Story Building with Cake Silo
Capital Cost ($)	12,574,000	11,473,000	10,666,000
Annual Cost ($/yr)	1,781,000	1,775,000	1,802,000
Present Worth of Annual Cost ($)	23,172,000	23,089,000	23,438,000
Total Present Worth ($)	35,746,000	34,562,000	34,104,000

Note: Comparative Costs Developed October 2005

The costs presented in Table 1 are preliminary in nature and costs for administration and construction management are not included. It is recommended that more refined costs based on a higher level of design detail be used for budgeting, rate setting, and other financial related purposes.

Since October 2005, the conceptual layouts were refined; the capital costs further developed and preferred building layout identified. The capital cost of this layout is estimated to be $11,428,000.

Table 1 includes significant energy savings in the present worth analysis. Because trucking requirements will decrease by approximately 50% for the cake material versus semi-solid material, total miles driven will decrease accordingly. As explained in Section 4, item 2, the transition to producing a biosolids cake product from a semi-solid product will reduce fuel consumption by approximately 15,150 gallons of fuel annually and will result in fuel cost savings of approximately $45,450.

Preferred Project Alternative

Based on the costs presented in Table 1 in the previous section, the recommended improvements for the biosolids dewatering facilities are a new, 2-story dewatering building with a storage silo. While the three alternatives are relatively close in present worth costs, the capital costs for this alternative are lowest and the storage of solids in a hopper is preferred from an operational standpoint.

During the evaluation a concern was raised that a silo might be too tall and presents an unacceptable visual impairment; however, with the layout and design as now configured will result in a structure no taller than fifty feet. A site plan and building section are shown in Figures 2 and 3.

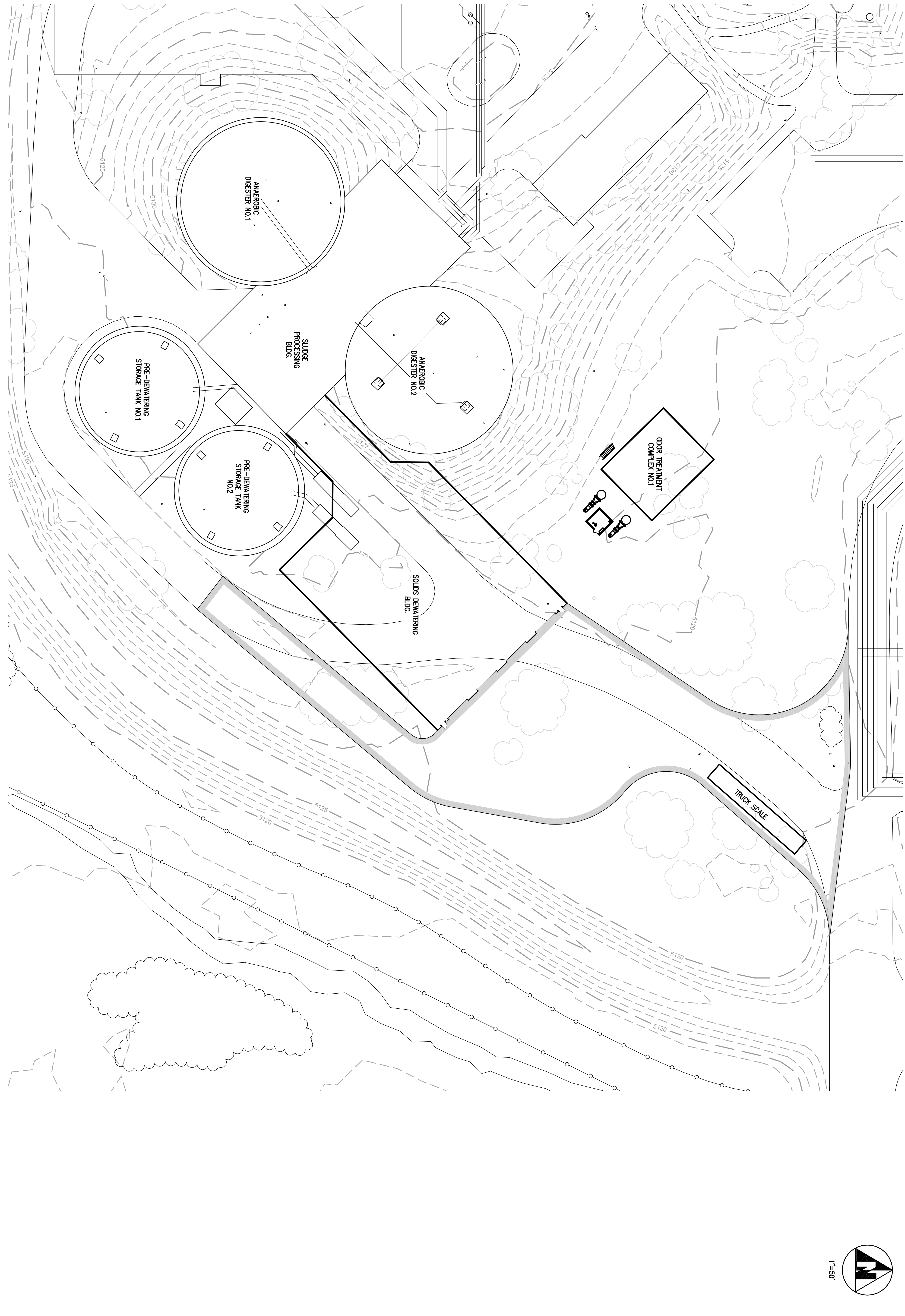

FIGURE 2 Solids Processing Building Area Site Plan

Rothberg, Tamburini & Winsor, Inc.

FILE PATH: H:\80750E\FIGS\FIG 3.DWG PLOTTED: 3/14/2006 1:39:32 PM (KELLY D. KRAMER)

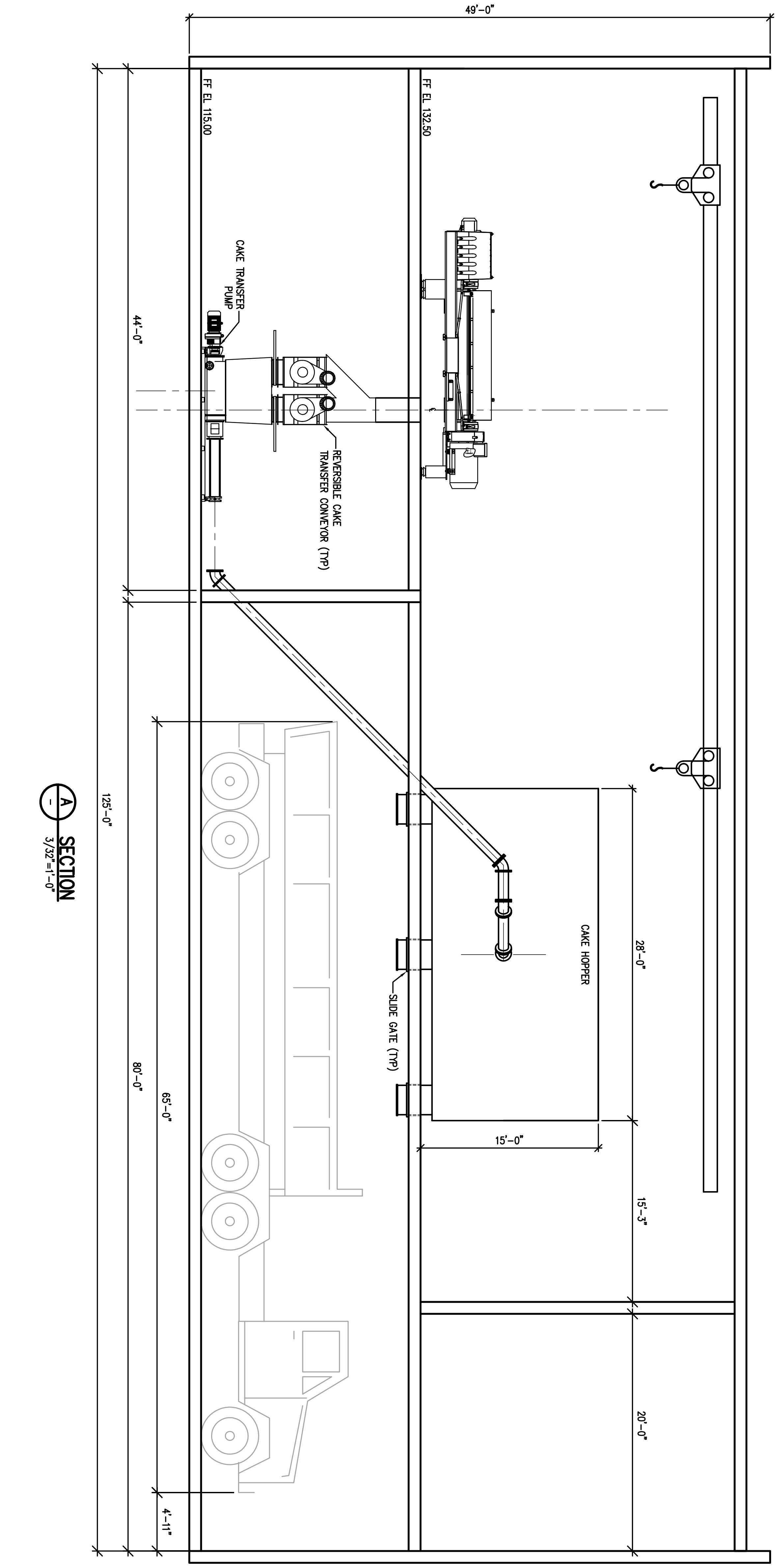

FIGURE 3 Solids Dewatering Building Section

Rothberg, Tamburini & Winsor, Inc.

Public Input to Date

To date, a preliminary project summary has been presented to the City of Boulder. The City of Boulder's 75th Street WWTP Dewatering Improvements project will be reviewed at the following public meetings:

- CEAP Review Committee Meeting – April 3, 2006
- Water Resources Advisory Board (WRAB) meeting: April 17, 2006
    - Review Community and Environmental Assessment Process (CEAP) report
- Public meeting: April date to be determined
- WRAB meeting: May 15, 2006
    - Request for recommendation to construct WWTP Dewatering Improvements
- City Council Meeting: June 2006

City of Boulder Project Manager

The City's primary contact for the WWTP Dewatering Improvements project is:

Douglas Sullivan
City of Boulder
Utilities Project Manager
1739 Broadway, P.O. Box 791
Boulder, Colorado 80306
303.441.3244
sullivand@ci.boulder.co.us

Consultants / Relevant Contacts

The project manager of the prime consultant for the project is:
Mr. David W. Oerke
Rothberg, Tamburini and Winsor, Inc.
1576 Sherman Street, Suite 100
Denver, Colorado 80203
303.825.5999
dwo@rtweng.com

Project staff includes:
Joseph U. Tamburini, Principal-in-Charge
David W. Oerke, Project Manager
José F. Velazquez, Project Engineer

Goals Assessment

1. *Using the Boulder Valley Comprehensive Plan (BVCP) and department master plans, describe the primary city goals and benefits that the project will help achieve.*

This project directly helps the City to meet its Facility and Service goals by providing increased treatment capability and capacity to the City's municipal wastewater treatment system. The City, through its master planning, regulations, policies and programs, will make every effort to create a sustainable community for future generations. Relevant environmental priorities include reducing waste by promoting reuse and recycling (e.g., land application of biosolids), preserving native plant and wildlife habitat, and improving water quality. The planned Dewatering Improvements Project will continue to provide wastewater service to existing customers as well as future residents and businesses. The upgrades will increase the level of treatment to accommodate higher levels of liquid treatment that are being provided and assure compliance with biosolids reuse requirements. The project will accommodate anticipated growth and development within the City while improving the long-term health of the natural environment, the economy, and the community.

1. *What are the trade-offs among city policies and goals in the proposed projects alternatives? (e.g. higher financial investment to gain better long-term services or fewer environmental impacts)?*

Upgrades and modifications to the City's dewatering facilities are necessary to expand solids treatment capacity to match the production from the liquid stream treatment process. The liquid stream capacity of the 75th Street WWTP is being expanded to handle projected growth within the City and provide capability to meet current and anticipated effluent limits. The proposed project is planned in one phase to minimize near-term capital expenditures and to coincide with the liquid stream upgrades. The relatively large short-term capital investment for the new facilities will result in substantially smaller future capital investments, allow for lower operation and maintenance costs, and reduce the number of vehicles, and thus fuel needed, to operate the biosolids management program.

The transition to producing a biosolids cake product from a semi-solid product, utilizing high-solids centrifuges, will reduce fuel consumption by approximately 50%. At buildout, the city will haul 27 truckloads of semi-solid biosolids to east Adams County each week. The trucks, which will make the 130-mile round trip five days a week, average 6 miles per gallon (mpg). This hauling activity requires fuel consumption of approximately 30,300 gallons of diesel fuel annually, which at $3/per gallon, equates to approximately $91,000 per year. The high-solids centrifuges will remove twice the water compared to the existing units, thereby, reducing truck trips by 50%. This trip reduction equates to a savings of approximately 15,150 gallons of fuel annually, and fuel cost savings of approximately $45,450.

2. *Is this project referenced in a master plan? If so, what is the context in terms of goals, objectives, larger system plans, etc.? If not, why not?*

Yes, this project is referenced in the 2002 Wastewater Utility Plan (WWUP). The WWUP is necessary to satisfy Denver Regional Council of Governments (DRCOG) requirements for Wastewater Master Planning and was approved by DRCOG in 2003. The WWUP confirmed and documented the need for the WWTP expansion and upgrade project. In 2003, the Wastewater Treatment Master Plan Summary of the September 2001 BVCP was updated to include information from the WWUP including the need to expand and upgrade the WWTP. In order to accommodate the expansion, both liquid and solids treatment facilities are needed.

3. *Will this project be in conflict with the goals or policies in any department master plan?*

This proposed project was referenced in the WWUP and the BVCP and therefore, and is consistent with the City goals and policies. More efficient biosolids management supports the BVCP sustainability policies.

4. *List other city projects in the project area that are listed in a departmental master plan or CIP.*

- Wastewater Treatment Plant Liquid Steam Improvements

5. *How will the project exceed city, state, or federal standards and regulations?*

The project is necessary to meet all current regulations; including pathogen and vector attraction reductions. The significant fuel consumption reduction will help reduce green house gas emissions.

Impact Assessment

The CEAP Checklist Question Form is presented on the following pages as Table 2. Alternative 1 is in reference to the “Do Nothing” alternative. Alternative 2 refers to the process resulting in the semi-solid (10-12% solids) material. Within alternative 2, 2A refers to a process that utilizes the existing structure, while 2B refers to a process that occurs within a newly constructed building. Alternative 3 refers to the process resulting in cake (>20% solids) material. Within Alternative 3, 3A refers to a process that utilizes the existing structure, while 3B refers to a process that occurs within a newly constructed building. Alternative 3B is the preferred alternative.

1. Using the attached checklist, identify the potential short or long-term impacts of the proposed project or (if applicable) the project alternatives.

Table 2 Community and Environmental Assessment Process Checklist

+ Positive effect

— Negative effect

O No effect

Project Title: CITY OF BOULDER BIOSOLIDS DEWATERING UPGRADES	**Alternative 1**	**Alternative 2**		**Alternative 3**	
		2a	**2b**	**3a**	**3b***
A. Natural Areas or Features					
1. Disturbance to species, communities, habitat, or ecosystems due to:					
a. Construction activities	O	—	—	—	—
b. Vegetation removal	O	O	—	O	—
c. Human or domestic animal encroachment	O	O	O	O	O
d. Chemicals (including petroleum products, fertilizers, pesticides, herbicides)	O	O	O	O	O
e. Behavioral displacement of wildlife species (due to noise from use activities)	O	O	O	O	O
f. Introduction of non-native plant species in the site landscaping	O	O	O	O	O
g. Changes to groundwater or surface runoff	O	O	O	O	O
h. Discharge of sediment to any body of water	O	O	O	O	O
i. Wind erosion	O	O	O	O	O
2. Loss of mature trees or significant plants?	O	O	O	O	O
B. Riparian Areas/Floodplains					
1. Encroachment upon the 100-year, conveyance or high hazard flood zones?	O	O	O	O	O
2. Disturbance to or fragmentation of a riparian corridor?	O	O	O	O	O
C. Wetlands					
1. Disturbance to or loss of a wetland on site?	O	O	O	O	O
D. Geology and Soils					
1. a. Impacts to unique geologic or physical features?	O	O	O	O	O

b. Geologic development constraints?	O	O	O	O	O
c. Substantial changes in topography?	O	O	O	O	O
d. Changes in soil or fill material on the site?	O	O	O	O	O
E. Water Quality					
1. Impacts to water quality from any of the following?					
a. Excavation	O	O	—	O	—
b. Change in hardscape	O	O	O	O	O
c. Change in site ground features	O	O	O	O	O
d. Change in storm drainage	O	O	O	O	O
e. Change in vegetation	O	O	O	O	O
f. Change in pedestrian and vehicle traffic	O	O	O	O	O
g. Use or storage of chemicals	O	O	O	O	O
2. Exposure of groundwater contamination from excavation or pumping?	O	O	O	O	O
F. Air Quality 1. Short or long term impacts to air quality (CO2 emissions, pollutants)?	—	—	—	—	—
a. From mobile sources?	—	—	—	—	—
b. From stationary sources?	O	O	O	O	O
G. Resource Conservation					
1. Changes in water use?	O	O	O	O	O
2. Increases in energy use?	—	—	—	—	—
3. Generation of excess waste?	O	O	O	O	O
H. Cultural/Historic Resources					
1. a. Impacts to a prehistoric or archaeological site?	O	O	O	O	O
b. Impacts to a building or structure over fifty years of age?	O	O	O	O	O
c. Impacts to a historic feature of the site?	O	O	O	O	O
d. Impacts to significant agricultural land?	O	O	O	O	O
I. Visual Quality					
1. a. Effects on scenic vistas or public views?	O	O	O	O	O
b. Effects on the aesthetics of a site open to public view?	O	O	O	O	O
c. Effects on views to unique geologic or physical features?	O	O	O	O	O
J. Safety					
1. Health hazards, odors, or radon?	O	O	O	O	O
2. Site hazards?	O	O	O	O	O
K. Physiological Well-being					
1 Exposure to excessive noise?	O	O	O	O	O
2. Excessive light or glare?	O	O	O	O	O
3. Increase in vibrations?	O	O	O	O	O
L. Services					
1. Additional need for:					
a. Water or sanitary sewer services?	O	O	O	O	O
b. Storm sewer/Flood control features?	O	O	O	O	O
c. Maintenance of pipes, culverts and manholes?	O	O	O	O	O
d. Police services?	O	O	O	O	O
e. Fire protection services?	O	O	O	O	O
f. Recreation or parks facilities?	O	O	O	O	O

g. Library services?	O	O	O	O	O
h. Transportation improvements/traffic mitigation?	O	O	O	O	O
i. Parking?	O	O	O	O	O
j. Affordable housing?	O	O	O	O	O
k. Open space/urban open land?	O	O	O	O	O
l. Power or energy use?	O	O	O	O	O
m. Telecommunications?	O	O	O	O	O
n. Health care/social services?	O	O	O	O	O
M. Special Populations					
1. Effects on:					
a. Persons with disabilities?	O	O	O	O	O
b. Senior population?	O	O	O	O	O
c. Children?	O	O	O	O	O
d. Restricted income persons?	O	O	O	O	O

*Alternative 3b is the preferred alternative.

Summary of Short-term and Long-term Impacts

Short-term (all alternatives):

- Vegetation, including grasses, shrubs, and forbs, within the fenced boundaries of the City of Boulder's 75th Street WWTP Site (site) will be disturbed during construction. A construction "staging area" may also be required to the east of the fenced boundaries. If this is required, the area just to the northeast of the main gate will likely be used. This area has been used recently for staging on other construction projects.
- Construction of the WWTP dewatering facilities upgrades will result in temporary disturbance (noise and increased traffic flow) to the surrounding communities.
- Temporary and minimal adverse impacts on air quality in the form of increased dust generation and exhaust emissions in the vicinity of the site are expected in association with construction activities. The construction contractor will be required to implement "best management practices" to minimize air quality impacts from the construction activities.

Minimal soil erosion may occur as a result of construction. The construction contractor will be required to implement erosion control measures to minimize soil erosion impacts from construction.

Long-term (all alternatives):

- The primary long-term (positive) impact of the project will be upgrades and modifications to the City's WWTP which will expand solids treatment capacity for projected growth within the City, increase capability to meet current and anticipated future effluent quality limits, reduce truck traffic from the WWTP associated with biosolids handling, and improve water quality in Boulder Creek.

- The WWTP currently has six air emissions permits, Air Pollutant Emission Notices (APENs), and Permit Exempt Points filed with the CDPHE. Since the WWTP will be upgraded and expanded at its existing location, current air quality issues are expected to remain in the long-term.
- The proposed alternative will require an increased commitment of resources in terms of energy and staffing to construct and operate improved facilities.
- An increased volume of biosolids is expected with the increase in influent flows and loads. The facility would continue to recycle biosolids by land application or at private composting facilities.
- It is estimated that the difference in odor generation between the alternatives being evaluated is not detectable. The treatment processes that generate the most significant and objectionable odors, include the preliminary, primary, and solids handling processes, which will be the same with any of the alternatives under consideration. Solids handling processes in this project will be constructed with odor control facilities
- Chemicals currently stored on the site include chlorine gas, sulfur dioxide gas, organic polymers, oil, gasoline, and pesticides. Once UV disinfection is implemented, chlorine gas and sulfur dioxide gas will not be used. This project will require that polymer use continue. No other chemicals will be used during operations.
- The drier cake biosolids will require 50% fewer trips to the disposal facility and will therefore significantly reduce truck traffic and fuel needed for hauling. An estimated 15,000 gallons of diesel fuel will be saved annually.

Questions

The following questions are a supplement to the CEAP Checklist.

A. Natural Areas and Features

Because there are no known occurrences of listed or sensitive species, nor is there habitat for any of these species within the limits of proposed construction, the project is expected to have no impact on any listed or sensitive species. Although there will be a long-term increase in discharge of water from the treatment plant to Boulder Creek as a result of the projected population growth and employment increase in the service area, no adverse impacts to listed or sensitive plant or animal species are expected to occur as a result of an increase in discharge. Therefore, there is no short or long-term potential for disturbance to or loss of significant species, plant communities, wildlife habitats, or ecosystems with either alternative. The biosolids dewatering facilities will have no adverse impact on the liquid stream discharged to Boulder Creek. Importantly, the construction of the proposed alternative will result in operations that are more reliable and with redundant capacity. As a result, Boulder Creek water quality will be better protected.

Some disturbance impacts related to the construction process are unavoidable. However, these impacts will be short-term and minimized when possible. The site will contain one new building structure and an odor control mechanism. The area that would be disturbed during the construction is estimated at less than one acre for any of the alternatives. Construction activities associated with any of the alternatives would not expand outside the current fenced and bermed site boundary with the possible exception of construction staging as described previously.

Plants, animals, and plant communities located within the construction site, such as individual plants, grasses, forbs, or shrubs directly in the footprint of new structures will be disturbed by the construction activities. There will be no potential for disturbance to or loss of mature trees or other large plants. The project will further minimize environmental impacts by restoring vegetation/landscaping disturbed by the construction, where possible. The proposed project will minimize the introduction of non-native plant species in the site landscaping.

During construction, water produced from construction site dewatering will be treated, if necessary, and discharged to Boulder Creek in accordance with permits issued by the CDPHE. A plan to control erosion and sedimentation will also be employed.

The WWTP currently has a Stormwater Management Plan (SWMP) in place that consists of four major components:

- Compliance with the CDPHE Light Industry Permit # COR-01 0865 requirements;
- Routine plant inspections;
- Continued training and drilling of the plant Emergency Response Team; and
- Annual review and revision of emergency response plans, including flood procedures.

An additional SWMP will be developed for construction, which will focus on implementing best management practices (BMPs) that would minimize sources of erosion and capture sediments before they enter surface waters.

Chemicals currently stored on the site include chlorine gas, sulfur dioxide gas, organic polymers, oil, gasoline, and pesticides. As described in the SWMP, plant inspections are conducted at least two times per year to check for potential problems related to stormwater. The inspections include:

1. The plant site is toured to ensure that no chemicals or drums are stored outside or on the loading dock.
2. The oil storage room is inspected to ensure the area is clean, oils are properly stored, and no oil leaks are present.

3. The pesticide storage cabinet is checked for cleanliness and proper storage, and the plant site is checked to make sure no pesticide containers are stored in other areas.
4. The elevated gas tank is checked to ensure the containment area is clear of any standing water and does not have any gasoline spillage.
5. The flood berm flap gates are checked for proper operation and to make sure no debris blocks the gate or channel.

Ten employees typically comprise the plant Emergency Response (ER) Team. The team addresses such issues as chlorine and sulfur dioxide leaks, biogas releases, and other assorted emergency responses, including chemical spills.

The City of Boulder currently has a Risk Management Plan (RMP) as required by EPA. The RMP consists of three general elements including a chlorine and sulfur dioxide hazard assessment, an accident prevention program, and an emergency response plan.

B. Riparian Areas and Floodplains

In 1986, berms were constructed around the plant site to remove it from the 100-year floodplain. No other natural hazards exist at the site. The Dewatering Improvements project would be contained within the existing site and would not encroach on the Boulder Creek 100-year floodplain. Since the site is not located in a floodplain, the project is not expected to have a significant direct impact on the floodplain.

C. Wetlands

No wetlands occur within the site and no dredging or filling of wetlands will be impacted by the project.

D. Geology and Soils

There will be no impacts to unique geological physical features, or significant changes in topography or soil/fill as a result of the project. There are no geological constraints to development at the site. A site application will be submitted to the CDPHE Water Quality Control Division (Division) for the proposed increase in capacity and modifications to the WWTP. A geotechnical report will be submitted as an attachment identifying geological suitability issues related to the existing site and the measures to be taken to mitigate any identified problems or risks.

E. Water Quality

All three alternatives are expected to have minimal direct impact on water quality and quantity downstream of the site. The new dewatering equipment will be more reliable than the existing equipment and thus potential for operational failures will be reduced. The more reliable processing facilities will provide better protection of downstream aquatic environment for plants and animals.

Water quality is not expected to be significantly impacted from changes in the amount of hardscape, permanent changes in ground features, changes in the storm drainage from the site, or changes in vegetation. The project will further avoid or minimize environmental impacts by restoring vegetation/landscaping disturbed by the construction, where possible.

The increase in short-term vehicle traffic during construction is not expected to have an impact on water quality.

Temporary or permanent use and/or storage of chemicals should not impact water quality, as all chemicals are stored inside. In addition, an RMP is in place that consists of three general elements including a chlorine and sulfur dioxide hazard assessment, an accident prevention program, and an emergency response plan.

During construction, water produced from construction site dewatering will be treated, if necessary, and discharged to Boulder Creek in accordance with permits issued by the CDPHE. BMPs as part of the construction SWMP will be implemented during construction to minimize the movement of sediment into surface waters.

The WWTP discharges to Boulder Creek, Segment 9, which is classified by the Division for the following beneficial uses:

- Recreation Class 1
- Aquatic Life Class 1, warm water
- Water Supply
- Agriculture

At present, none of the classifications are being challenged as being too low to protect present uses. If the "No Action" alternative was selected, discharge permit violations would likely occur.

F. Air Quality

Activities associated with the proposed alternatives during construction would have a temporary and minimal adverse impact on air quality in the vicinity of the site. Short-term increases in dust generation and exhaust emissions in the vicinity of the site would be associated with construction activities. Water spraying and application of other remedies would be utilized during construction to minimize short-term dust generated by construction activities. The proposed alternative is not expected to have a significant direct short-term impact on air quality.   The WWTP currently has six air emissions permits, APENs, and Permit Exempt

Points filed with the CDPHE. Since the WWTP will be upgraded and expanded at its current location, air quality issues are expected to remain in the long-term.

Once completed, the new dewatering facilities will produce a significantly drier cake and thus less volume than current operations. The lower volume will require fewer trucks, thus exhaust emissions over the long-term will be reduced. This fuel consumption reduction will contribute to reducing green house gas emissions.

It is estimated that the difference in odor between the alternatives is non-detectable. The new dewatering facilities will be constructed with odor control systems to minimize the escape of potentially odorous air. Should odors become a greater concern in the future a prioritized approach to mitigate odors will be implemented, most likely beginning with preliminary treatment.

G. Resource Conservation

As mentioned previously, the transition to producing a biosolids cake product from a semi-solid product, utilizing high-solids centrifuges, will reduce fuel consumption by approximately 50%. This trip reduction equates to a savings of approximately 15,150 gallons of fuel annually, and fuel cost savings of approximately $45,450.

Significant changes are not anticipated with water usage at the WWTP. When restoring landscaping, the City will consider low water usage native plants and grasses to minimize water use on the site. All alternatives would require an increased commitment of resources in terms of energy to construct and operate improved facilities. The WWTP currently produces electricity and heat that is reused on site to help reduce the energy required from Xcel Energy; however, it is anticipated that new electrical feeds would be needed to provide power to the site to operate and maintain the proposed improvements. As a result, the proposed upgrade is expected to have an impact on energy use at the site.

An increased volume of biosolids is expected with the increase in influent flows and loads. The facility would continue to recycle biosolids by land application or composting. None of the alternatives are expected to have a significant impact on solid waste at the site.

H. Cultural/Historic Resources

The upgrades at the WWTP will not extend outside the current site boundaries and so are not expected to impact cultural resources. Since no cultural resources are known to exist at the site, significant direct impacts to cultural resources are not expected. No lands of agricultural importance will be disturbed at the site.

I. Visual Quality

Visually, new buildings associated with the proposed alternative will permanently change the appearance of the site. New buildings will be designed to match existing structures, where appropriate, and to provide a pleasing aesthetic appearance. The proposed alternative is not expected to have a significant impact on the existing physical aspects at the site.

The site has been used as a WWTP facility since 1968. The site includes numerous WWTP structures, with the remaining portions of the property covered with asphalt, concrete, or landscaping. Therefore, scenic views or the aesthetics of the site are not expected to be impacted significantly with any of the proposed alternatives. Figure 4 is a photograph of the existing structure.

Figure 4 – Existing Dewatering Facilities

Figures 5 through 7 illustrate the visual aspects of the finished facility at buildout.

Figure 5 – New Dewatering Facilities (looking west)

Figure 6 – Overall Site View with New Dewatering Facilities

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Figure 7 – New Dewatering Facilities from 75th Street

J. Safety

Implementation of proposed improvements would reduce the potential for public health problems. The safety of plant personnel will be improved with infrastructure improvements providing better working conditions.

Typically ten employees comprise the plant ER Team that addresses chlorine and sulfur dioxide leaks, biogas releases, and other assorted emergency responses, including chemical spills. The team trains on plant specific issues on a monthly basis. In addition, the team members have either completed the 40-hour HAZWOPER course or 24-hour chlorine/sulfur dioxide response class. Sufficient personal protective gear is maintained on site to allow for full Level A suit and Self Contained Breathing Apparatus (SCBA) response to chemical spills or leaks. An ER Team notebook was developed that includes all plant response procedures, equipment instructions, Material Safety Data Sheet (MSDS) information, and safety drill debriefings.

In addition to the ER Team training, the treatment plant operations staff is trained to respond to chlorine and sulfur dioxide leaks. The City of Boulder currently has a RMP as required by EPA. The RMP consists of three general elements including a chlorine and sulfur dioxide hazard assessment, an accident prevention program, and an emergency response plan. It should be noted that many of the existing plant emergency procedures were applicable for inclusion in the RMP. The RMP will be reviewed and revised as necessary in 2007.

K. Physiological Well-being

There will be no permanent impacts to physiological well being of nearby residents as a result of the project. Inhabited areas around the site would not be impacted by the facility expansion, as all construction and new facilities would be contained within the existing site. Some minor, temporary impacts to the neighborhood immediately surrounding the WWTP will occur due to construction. Impacts to traffic, increases in ground vibration, and increases in noise as a result of construction will be minimal and restricted to the immediate vicinity of the site. Construction will be conducted during daytime hours only, to minimize impacts.

Short-term increases in the noise level at the WWTP would accompany construction activities. The proposed alternative is not expected to have an adverse impact on public health at or adjacent to the site. However, due to increased reliability and redundancy of the proposed alternative, public health can be better protected.

The beneficial effects of the project include increased WWTP capacity to accommodate planned development and reductions in truck traffic associated with biosolids hauling to and from the site. Also, more reliable dewatering facilities are more protective of the water quality in Boulder Creek.

L. Services

No increased need for services in the City of Boulder is anticipated as a result of this project. Contract hauling services will be reduced at the WWTP and will result in fewer trucks on nearby roads.

M. Special Populations

No temporary or long-term impacts to special populations, including persons with disabilities, seniors, or restricted income persons are likely to occur as a result of this project. As the proposed project will expand an existing facility, no specific benefits or adverse affects are expected for land developers or land values in the area.

Expansion of the dewatering facilities at the WWTP will enable planned development of the service area to continue. Upgrades to the site will improve the surrounding environment by improving water quality and improving aesthetics through additional landscaping.

Employment opportunities would be provided over the short-term during construction and start-up and possibly over the long-term by increased staff requirements.

The city increased wastewater rates on January 1, 2006 to provide sufficient revenue to fund this project. Revenue bonds were issued in 2005 for the construction of this project as well as the liquid stream improvement project. The proposed alternative is not expected to have a significant impact on economic and social profiles near the site or within the service area.